

AMENDMENTS TO THE SPECIFICATION

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Please replace the paragraph beginning at page 1, line 5, with the following rewritten paragraph:

A1
-- This application claims priority from now abandoned U.S. Patent Application Serial Number 60/170,147 filed on Dec. 10, 12/10/ 1999 which is incorporated herein by reference for all purposes. ~~Pending U.S. application entitled an OPTICAL COMMUNICATION NETWORK WITH RECEIVER RESERVED CHANNEL~~ by the same inventor was filed September 1, 2000 and ~~pending U.S. Application entitled OPTOELECTRONIC CONNECTOR SYSTEM~~ by the same inventor and filed September 1, 2000, and are incorporated by reference herewith. This application is a continuation-in-part of U.S. Application Serial No. 09/653727 entitled an OPTICAL COMMUNICATION NETWORK WITH RECEIVER RESERVED CHANNEL, filed September 1, 2000 and now U.S. Pat. No 6,674,971; and a continuation-in-part of U.S. Application Serial No. 09/653,647 entitled OPTOELECTRONIC CONNECTOR SYSTEM, filed September 1, 2000 and now U.S. Pat. No. 6,434,308, which are hereby incorporated by reference for all purposes. --

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Please replace the paragraph beginning at page 8, line 6, with the following rewritten paragraph:

A2
-- Overall, the complexity and cost of the prior art systems have prevented large-scale integration. Thus, there is a need for increased system bandwidth through both increased data rates and improved mechanical and electrical interconnects. --

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Please delete the paragraph beginning at page 7 line 20.

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Please replace the paragraph beginning at page 8, line 10, with the following rewritten paragraph:

A3
-- What is needed is a means for reducing the latency so that it is not a significant factor in limiting data transfer. In other words, what is needed is a way of transferring data from one node in a network to any other node in the network in a bit-parallel manner in such a way that each

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intervening node that touches the data (whether switch or network interface controller - NIC) minimizes the time required to process data through. In ~~the best~~ one case, the switch/device should act like wire or fiber and require no processing. What is needed is a way of resolving this address interpretation problem that eliminates the delay associated with the transfer of data. What is needed is a uniform device that can be used as both NIC and switch so that the switching function is essentially free and the NIC function is inexpensive. What is needed is a device that does not increase message latency by requiring packet loss checks and frequent retransmission of packets when contention occurs. Ideally, what is needed is a network with wide channels, fast links, small and reliable connectors, low power, low latency, and minimal impact on higher-level communication protocols. From a practical point of view, these features must be offered as a cost-effective solution. --

Please replace the paragraph beginning at page 8, line 27, with the following rewritten paragraph:

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-- The present invention concerns integrated circuit technology that enables bi-directional, high-speed computer network interconnection communication, particularly in a star configuration. The present invention employs laser emitters and detectors to be integrated onto a semiconductor substrate, making electrical connection with electronic circuitry previously built on that substrate. In ~~a preferred~~ one embodiment the star topology has a ~~dedicate~~ dedicated receiver channel. --

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Please replace the paragraph beginning at page 9, line 27, with the following rewritten paragraph:

-- In a preferred embodiment this receiver reserved convention is fabricated using semiconductor technology to incorporate the components of a node on a single IC or chip. And, the communication to/from the nodes is via fiber optic cables arranged to permit bi-directional data flow from the transceiver arrays. --

Please delete the paragraph beginning at page 14, line 2.

Please replace the paragraph beginning at page 16, line 12, with the following rewritten paragraph:

Ag
-- Although one ~~the preferred~~ embodiment is to use a dedicated receiver channel for each node, there are alternate embodiments that can be used. One alternate method is to encode a source address and/or destination address(es) in the first few bits of header data. For transmitting large quantities of data from relatively few sources, or if the data comes from multiple units of time in a packet, this method would be efficient. There are some prior art attempts at such encoding. --

Please replace the paragraph beginning at page 16, line 30, with the following rewritten paragraph:

Px
-- The clock signal can be ~~is preferably~~ embedded in the data. Alternatively, it can be a separate pixel. If the clock signal is not embedded a phase-locked loop (PLL) needs to be included on every input channel, which costs more in terms of design time, integrated circuit real-estate, and power. Since the present system has more bandwidth, it is practical to have a separate pixel as a baseline with the option of moving to the PLL solution. --

Please delete the paragraph beginning at page 19, line 29.

Please replace the paragraph beginning at page 20, line 7, with the following rewritten paragraph:

PO
-- Still other objects and advantages of the present invention will become readily apparent to those skilled in this art from the detailed description, wherein we have shown and described only certain embodiments ~~a preferred embodiment~~ of the invention, simply by way of illustration of modes ~~the best mode~~ contemplated by us on carrying out our invention. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modifications in various obvious respects, all without departing from the invention. --

Please replace the title beginning at page 22, line 1, with the following rewritten title:

A9 -- DETAILED DESCRIPTION OF THE INVENTION ~~PREFERRED EMBODIMENT~~ --

Please replace the paragraph beginning at page 22, line 3, with the following rewritten paragraph:

A10 -- To those skilled in the art, the invention admits of many variations. The following is a description of one ~~a preferred~~ embodiment, offered as illustrative of the invention but not restrictive of the scope of the invention. This invention involves a method and apparatus for transferring data within the nodes of a communication system. The invention is a dramatically increased capability for transmitting and receiving data within a network. These novel aspects will be discussed in terms of several scenarios that demonstrate the various aspects of the invention. --

Please replace the paragraph beginning at page 24, line 19, with the following rewritten paragraph:

A11 -- For example, all data intended for leaf node 4 (440) will only be transmitted to ~~by~~ LR3. All data from the other nodes that is received by any of the central node reserved receivers CR3, will automatically be directed to the central node transmitter CT3 and transmitted to ~~the~~ LR3. The central node 400, that handles data management, will only use CT3 to send data to LR3. The dedicated links between the central node 400 and the leaf nodes eliminates node addressing. More importantly, the latency is decreased because the central node does not have to read destination address information on data arriving on the dedicated receivers. Furthermore, the circuitry on the leaf node is minimized by eliminating the need for reading addresses on the transmitted data onto the node. --

Please replace the paragraph beginning at page 25, line 12, with the following rewritten paragraph:

A12 -- In FIG. 6, four 4 x 2 leaf nodes 510, 520, 530, 540 send data to and from a 4 x 8 central node 500 which is divided into subarrays 550, 560, 570, 580 and accepts the data from each of

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the leaf nodes. In this example, each of the leaves is a 2 x 2 node, that provides a 4 bit, bi-directional bus 555. Each of the leaves sends and receives a 4 bit bus packet to/from the central node 500. The central node 500 uses RRC to function as a 4 x 4 crossbar directly routing incoming data from each leaf node 510, 520, 530, 540 out to the appropriate output destination, or it takes the data from each node and routes it in a circular pattern through each quadrant or subarray 550, 560, 570, 580 and then clocks it out to the appropriate leaf node when the data is underneath the appropriate emitters. Thus, the present invention allows a system to be logically configured as either a ring or a star topology with a single physical connection.

Please replace the paragraph beginning at page 28, line 5, with the following rewritten paragraph:

A13
-- The star topology can be scaled to larger and more complex networks until the practical limits of assembly are exceeded. For example, a 1000 node system containing sixteen by sixteen arrays would require a central node with an array one thousand times larger than a sixteen by sixteen array. For large systems, the central node array 955 is divided into several smaller arrays or subarrays where each smaller array is optically coupled as illustrated in FIG. 10B. The central node fiber bundles 950 interconnect to smaller central node arrays enabling the larger central node 955 to operate at fiber optic speeds. The leaf nodes connections 960 of the divided central array 955 transmit optical data from the divided central node 955 through optical fiber bundles 960 to specified leaf nodes. --
